Problem K. Korfbal

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	1024 mebibytes

Mihail and Leon are playing a game of **korfbal**. Korfbal is played as follows: the players have n piles, each consisting of some number of **korfballen** (football-sized balls). The players take turns, with Mihail going first. In each turn, the current player selects one of the piles, chooses a non-empty subset of the korfballen in the chosen pile, and throws them all into the **korf**. The player who scores the last korfbal wins the game.



Figure 11: A game of korfbal. The rules are slightly different from those in this problem.

However, Mihail and Leon have drunk a few cans of Heineken, and they are feeling a bit tipsy. They know that, once they have selected the korfballen they will attempt to throw, there is a 50% chance that they will miss all of them at once, and a 50% chance that they will score all of them at once. If a player misses the thrown korfballen, they have to put them back onto the pile where they came from.

Since Mihail and Leon are very competitive, they will devise an optimal strategy to maximize their respective chances of winning the game. Can you calculate the probability that Mihail wins if both players play optimally? Output this probability, which can be deduced to be a rational number, modulo the prime number $10^9 + 7$.

Input

The first line consists of one integer n ($1 \le n \le 2 \cdot 10^5$), the number of piles of korfballen.

The second line consists of n integers $a_1, \ldots, a_n$ ($1 \le a_i \le 10^9$), the number of korfballen in each pile.

Output

You should output one integer p ($0 \le p < 10^9 + 7$), the probability of Mihail winning the game modulo $10^9 + 7$.

It can be proven that the probability can be written as a reduced fraction $\frac{a}{b}$, with $b \not\equiv 0 \pmod{10^9 + 7}$.

Hence, p is the unique integer that satisfies $p \cdot b \equiv a \pmod{10^9 + 7}$.

Examples

standard input	*standard output*
3 419430657 349004802 231564547	0
3 207921793 178655361 113422849	1
1 1	666666672